REMARKS/ARGUMENTS

Claims 1-24 are pending in the present application. Claims 1, 5-8, and 13 are amended. Claims 15-24 are added. Claims 1, 6, 7, and 13 are independent.

Applicants respectfully submit that the amendments to independent claims 1 and 6 are not narrowing. It is further submitted that the amendments were not made for a reason relating to patentability. Applicants submit that, in fact, claims 1 and 6 have been amended to broaden the scope of the claimed invention. Accordingly, it is submitted that these amendments do not give rise to estoppel and, in future analysis, claims 1 and 6 are entitled to their full range of equivalents.

§112 Rejections

Claim 5 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Particularly, the Examiner asserts that "it seems that the combining means is the conical reflector which receives and combines the light into a single beam." (See Office Action at page 2.) Thus, the Examiner concludes that "a conical reflector positioned between the means for receiving and combining infrared light and said [collimating] lens" recited in claim 5 is indefinite. Applicants respectfully disagree.

Applicants respectfully submit that the conical reflector described in exemplary embodiments of the present invention is not part of the claimed means for combining and receiving.

Instead, the specification clearly discloses that, according to an exemplary embodiment, the means for combining and receiving is comprised of optical positioning plate 106. In particular, page 5: line 32 - page 6: line 2 of the specification discloses an embodiment in which "[t]he light received by [the optical transmission means] is transmitted to the optical positioning plate 106, and is *combined in the optical positioning plate* 106 to form a single beam of infrared light" (emphasis added). In lines 7-10 of page 6, the specification further discloses that the "conical reflector 120...may optionally be placed between the optical positioning plate 106 and the...lens 102 to further direct the infrared light emitted by the optical positioning plate."

In the above exemplary embodiment, the optical positioning plate 106 comprises means for receiving and combining the infrared light, while the conical reflector 120 is positioned between these means and lens 102. Therefore, Applicants submit that the conical reflector recited in claim 5 is not indefinite.

For the reasons indicated above, Applicants respectfully request reconsideration and withdrawal of this rejection.

Synopsis of the Present Invention

The present invention is directed to a device and method for generating a high intensity infrared (IR) light. The present invention utilizes two or more IR laser diodes 110 are used as light sources. According to an exemplary embodiment, a plurality of optical transmitters (e.g., optical fiber 107 or light pipe) is provided, each being configured to receive and transmit the infrared light radiated by a corresponding laser IR diode. The light transmitted by each of the optical transmitters is combined into a single beam (or source) of IR light by, e.g., an optical positioning plate 106 or some other device for receiving and combining the light. According to this exemplary embodiment, lens 102 (e.g., an aspheric lens) may be provided to receive and collimate this combined beam of IR light.

As this beam of IR light combined from the outputs of the optical transmitter (e.g., using the optical positioning plate) will naturally expand, an optional exemplary embodiment of the present invention includes a conical reflector 120 to help direct the expanded light to the collimating lens 102.

Accordingly, the IR light transmitted through the aspheric lens may be used for applications requiring high intensity IR light. For example, the light may be used as an aircraft landing light or searchlight during covert operations

(due to the fact that IR light cannot be viewed by the unaided eye). The present invention is particularly advantageous for such applications because the IR light radiated by the laser IR diodes is combined into an expanded beam. Therefore, the present invention does not require additional optical systems (e.g., lenses) to expand the IR light transmitted from the laser IR diodes. This results in a smaller size and weight for the IR lighting device, which is critical for aerospace applications, while reducing the costs of manufacturing the device.

Prior Art Rejections

Claims 1-14 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,142,650 to Brown et al. (hereinafter "Brown"). This rejection is respectfully traversed for the following reasons.

As set forth in Section 2131 of the MPEP Original Eighth Edition, August, 2001, page 2100-68:

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. V. Union Oil Co. Of California, 814 F2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claims." Richardson v. Suzuki Motor Co., 868 F2d 1226, 1236, 9 USQP2d 1913, 1920 (Fed. Cir. 1989).

It is respectfully submitted that the prior art cited by the Examiner does not set forth each and every element as defined in the claims. Thus, the Examiner's rejection based on 35 USC 102 has been obviated.

Particularly, independent claims 1 and 6 each recite a lens collimating a beam of infrared (IR) light, which is received and combined from multiple laser IR diodes. Similarly, independent claims 7 and 13 each recite transmitting a beam of IR light, which is received and combined from a plurality of laser IR diodes, through a lens configured to collimate the beam of IR light. Applicants respectfully submit that these features are not taught by Brown.

Brown discloses a flashlight with a diode package 16 (utilizing a diode light source 48), whose light excites laser resonator 18. In turn, the laser resonator 18 emits a beam to a beam expander 20. The beam expander 20 may include one or more aspheric lenses (54, 56, and 58 of Fig. 1; or 114 in column 9: lines 15-25), which are used to expand the beam and ensure maximize light dispersion. The expanded light may then be collimated using objective lens 112 (in Fig. 5).

Brown particularly teaches that the resonator 18 outputs a green laser whose wavelength is near 532 nm (see, e.g., Brown at column 4: lines 19-32 and column 6: lines 8-20). Brown further discloses several uses for the flashlight, all of which utilize visible light, i.e., light not within the IR range.

Accordingly, Applicants respectfully submit that Brown fails to disclose a lens for collimating a beam of IR light combined from multiple laser IR diodes. As mentioned above, the aspheric lenses (including lens 54) are used to expand beams -- not collimate. Also, Brown's collimating lens 112 does not receive IR light. Instead, it is respectfully submitted that in Brown, the resonator 18 outputs a beam outside of the IR range to lens 112.

It is noted that Brown discloses a collimating lens 124 in connection with the embodiment of Fig. 6. However, Applicant respectfully submits that Brown fails to expressly disclose the use of multiple laser diodes in connection with the embodiment. Brown only mentions an array of diodes in connection with the separate embodiment of Fig. 5 (see column 7: lines 35-48). Furthermore, even assuming for the sake of argument that Brown's device in Fig. 6 could use multiple diodes, this embodiment only teaches that the collimating lens 124 receives light directly from the diodes, rather than from any receiving and combining means. See Brown at column 9: lines 63-66, "[i]n the embodiment of Fig. 6, a laser diode 120 mounted on a heat sink 122 has a collimating lens 124 attached to it *close to the diode output face*" (emphasis added).

It is further noted that Brown's teaching of a lens-based beam expander 20 for expanding the beam adds to the size, weight and manufacturing costs of Brown's device, thereby making Brown's device inappropriate for aerospace

applications (e.g., as an aircraft searchlight). The present invention does not require the implementation of such lenses to sufficiently expand the beam (as discussed in the above Synopsis). Thus, exemplary embodiments of the present invention do not suffer from these shortcomings.

It is respectfully submitted that Brown fails to disclose a lens configured to collimate a beam of IR light received and collected from multiple laser IR diodes, as required by independent claims 1, 6, 7, and 13. Applicants respectfully submit that these independent claims are allowable at least for this reason. Further, Applicants submit that claims 2-5, 8-12, and 14 are allowable at least by virtue of their dependency on claims 1, 6, 7, and 13. Reconsideration and withdrawal of this rejection is respectfully requested.

Conclusion

In view of the above remarks, Applicants respectfully request the Examiner to issue a Notice of Allowance in connection with the pending claims. Should the Examiner believe that any outstanding matters remain in this application, the Examiner is encouraged to contact Jason Rhodes (Reg. No. 47,305) at the telephone number of the undersigned in order to discuss this application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to debit Deposit Account No. 02-2448 for any additional fee required under 37 C.F.R. §1.16 or §1.17, particularly extension of time fees, or to credit said Deposit Account for any overpayment of fees.

Respectfully submitted,

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